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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Expert: Ph.D. Nikita Soubbotin

Serial No. : 09/463,598

Filed : January 27, 2000

Title : FROST RESISTANT HEATING/COOLING FLUID

Art Unit : 1751

Examiner : Derrick G. Hamlin

Attorney Docket: GP7287US.RCE (#90225)

Commissioner for Patents  
Washington, D.C. 20231

DECLARATION of NIKITA SOUBBOTIN, Ph.D.  
TRAVERSING REJECTION  
PURSUANT TO 37 CFR 1.132

Dear Sir:

Under the provisions of 37 C.F.R. 1.132, Applicant would like to call the Examiner's attention to the following objective evidence of non-obviousness regarding the above-identified application.

1. I, (Nikita Soubbotin, Aspgården 25, 435 32 Mölnlycke, Sweden) am an expert in frost resistant heating/cooling fluids.
2. I have a Ph.D. degree which was awarded to me by Institute of General and Inorganic Chemistry of Ukrainian Academy of Science in 1989.
3. I have spent 3 years in the research and development of frost resistant, non-toxic heating/cooling methods and products.

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4. I am employed as head of laboratories including R&D at Aspen Petroleum since 2000.

5. I have published the following papers:

1. N.L. Dovgan, N.P. Davidenko, N.B. Subbotin, V.V. Pluzhnik. Synthesis of 6-bromo-2-methylenebicyclo(3.3.1)nonane. Vestn. Kiev. Plitekh., Inst., Khim. Mashinostr. Tekhnol. 23, 8-12, 1986.
2. N.B. Subbotin, L.G. Tomilova, Kostromina N.A., Luk'yanets E.A. Synthesis and spectral-electrochemical investigation of monophthalocyanine of Rare-Earth elements. Zh. Obshch. khim., Vol. 56, No. 2, pp. 397-400, February, 1986.
3. N.B. Subbotin, L.G. Tomilova, Kostromina N.A., Luk'yanets E.A. Synthesis of unsymmetrical diphthalocyanine of Rare-Earth elements. Zh. Obshch. khim., Vol. 56, No. 1, pp. 232-233, January, 1986.
4. N.B. Subbotin, L.G. Tomilova, Kostromina N.A., Luk'yanets E.A. Spectral investigation of monophthalocyanine of Rare-Earth elements. The book of scientific report thesis's. XI Ukrainian Conference in Inorganic Chemistry Kiev. 1986.-p.225
5. N.B. Subbotin, L.G. Tomilova, Kostromina N.A., Luk'yanets E.A. Directional Synthesis and Investigation of Mono- and Diphthalocyanines of Rare-Earth Elements. The book of scientific report thesis's. IV All-Soviet Conference in Chemistry and application of porphyrins. Eleven 1984, p.65.
6. N.B. Subbotin, L.G. Tomilova, Kostromina N.A., Luk'yanets E.A. Peculiarities of formation of Non-metal Phthalocyanine in Non-aqueous solvents. The book of scientific report thesis's. I All-Soviet Conference "Chemistry and Application of Non-aqueous Solution" - Ivanovo, 1986, p.346.
7. L.G. Tomilova, N.B. Subbotin, Kostromina N.A., Luk'yanets E.A. Method of Synthesis of Phthalocyanine with Rare-Earth Elements. Patent of USSR No 124696 from 01.03.1986.
8. N.B. Subbotin, L.G. Tomilova, Kostromina N.A., Luk'yanets E.A. Method of Synthesis of Monophthalocyanines of Rare-Earth Elements. Patent of USSR No 126233 from 08.06.1986.
9. N.B. Subbotin, L.G. Tomilova, E.V. Chernykh, U.N. Karpov, V.N. Treshchalin, S.A. Korobov, N.A. Kostromina, E.A. Luk'yanets. Method of Synthesis of Non-Metal Phthalocyanine. Patent of USSR No 1325885 from 22.03. 1987.
10. E.A. Kuzminsky, A.V. Gorodisky, O.A. Mashkin, N.B. Subbotin, N.A. Kostromina. Chemical Current Source. Patent of USSR No 4255650/07 from 08.12.1987.

11. E.A. Kuzminsky, A.D. Skakalsky, O.A. Mashkin, N.A. Kostromina, N.A. O.P. Stupak, N.B. Subbotin, S.M. Remez, A.B. Pecheny. Chemical Current Source. Patent of USSR No 4295855/07 from 14.03.1988.
12. N.B. Subbotin, L.G. Tomilova, Kostromina N.A., Luk'yanets E.A. Investigation of Mix-ligand Monophthalocyanines of Rare-Earth Elements. The book of Scientific Report Thesis's. III All Soviet Conference in Chemistry and Biochemistry of Macrocyklic Compounds. Ivanovo. 1988. p. 165.
13. N.B. Subbotin, V.N. Nemykin, Y.Z. Voloshin. A synthesis of Novel Nonsymmetrical Phthalocyanines. Mendelev Comm., 121-123, 1993.
14. I.V. Komarov, V.N. Nemykin, N.B. Subbotin. New Selektive Shift Reagents for Primary Aliphatic Amines on the Base of Monophthalocyanine Lanthanide Complex. 1993, Appl. Magn. Reson. 4, 337-382.
15. V.N. Nemykin, N.B. Subbotin, N.A. Kostromina and S.V. Volkov. Method of preparation of phthalocyanine transition metal complexes. 1993. Russ. pat.
16. S. Li, K. Lundquist, N. Soubbotin. Separation av diastereomererna 1,2,3-propandiol och 1-aryloxi-1,3-propandiol med jonbyteskromatografi. 15:e Organikerdagarna. Göteborg 1994.
17. S. Li, K. Lundquist, N. Soubbotin. Separation of lignin model compounds of the 1,3-diol type by ion-exchange chromatography. Holzforschung. 48, 509-511, 1994.
18. V.N. Nemykin, N.B. Subbotin, N.A. Kostromina, S.V. Volkov. Lukyanets E.A. Synthesis and properties of asymmetrical dinaphthodibenzoporphyrine complexes with D-2H symmetry of the ligand. Zhurnal neorganicheskoi Khimii. 40(7):1183-1188, 1995 Jul.
19. V.N. Nemykin, N.B. Subbotin, N.A. Kostromina, S.V. Volkov. New, non-symmetrical 2/2 Phthalocyanines, 1,2,3,4,15,16,17,18,octaphenyl-9,23(30)-di-tert-butyl dinaphthalocyanine copper complexes, Mendelev Communications. (2):71-72, 1995 Mar.
20. S.M. Li, K. Lundquist, N. Soubbotin, R. Stromberg. 2Bromo-4-(2-bromo-(E)propylidene)-6-methoxy-2,5-cyclohexadien-1-one. Acta Crystallographica- Section C - Crystal Structure Communications. 51(Part 11):2366-2369, 1995 Nov. 15.
21. V.N. Nemykin, N.B. Subbotin, N.A. Kostromina, S.V. Volkov. Synthesis and properties of highly soluble tetra-tert-butyl-2,3-naphthalocyanine complexes of lanthanides. Russian Chemical Bulletin. 45(1): 89-92, 1996 Jan.
22. R. Lundqvist, N. Soubbotin. Molecular weight studies on hydroxypropyl methylcellulose. I. Osmometry. ISPA-9, 1-3 July, 1996, Oxford University, U.K.

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6. I am an inventor of the following patents.

1. L.G. Tomilova, N.B. Subbotin, Kostromina N.A., Luk'yanets E.A. Method of Synthesis of Phthalocyanine with Rare-Earth Elements. Patent of USSR No 124696 from 01.03.1986.

2. N.B. Subbotin, L.G. Tomilova, Kostromina N.A., Luk'yanets E.A. Method of Synthesis of Monophthalocyanines of Rare-Earth Elements. Patent of USSR No 126233 from 08.06.1986.

3. N.B. Subbotin, L.G. Tomilova, E.V. Chernykh, U.N. Karpov, V.N. Treshchalin, S.A. Korobov, N.A. Kostromina, E.A. Luk'yanets. Method of Synthesis of Non-Metal Phthalocyanine. Patent of USSR No 1325885 from 22.03.1987.

4. E.A. Kuzminsky, A.V. Gorodisky, O.A. Mashkin, N.B. Subbotin, N.A. Kostromina. Chemical Current Source. Patent of USSR No 4255650/07 from 08.12.1987.

5. E.A. Kuzminsky, A.D. Skakalsky, O.A. Mashkin, N.A. Kostromina, N.A. O.P. Stupak, N.B. Subbotin, S.M. Remez, A.B. Pecheny. Chemical Current Source. Patent of USSR No 4295855/07 from 14.03.1988

7. One of the big problems with heating/cooling fluids is toxicity; if this problem is alleviated by using a strong ionic solution, a second problem of corrosiveness arises. This problem has resulted in, or could result in, the dire consequences of corrosion, leakages, excess of oxygen in the fluid, decreased heat transfer etc.

8. Prior to the invention in the above-identified application, I was, and am still not, aware of any prior uses of a frost resistant, non-toxic heating/cooling fluid with corrosive inhibitor. To my knowledge, prior to my invention, others were not making or using a frost resistant, non-toxic heating/cooling fluid as described in the above-identified application.

9. This is not a method which would have occurred to others skilled in this art because glycols are the mainly/only fluid on the market for similar applications. Indeed, one skilled in the art would have been led away from the invention because earlier salt based heating/cooling fluids, for instance calcium chloride, have needed inhibitors with very high impact on the environment.

10. The present invention is basically different from Miller et al., United States Patent No. 5,242,621. Miller et al. is directed to heating/cooling fluids which contain glycol. The glycol makes the fluid toxic and environmentally undesirable. This is because glycols are highly toxic to man but also to the biological step in the sewage treatment plants.

11. Back et al., U.S. Patent No. 5,993,684 discloses a method and composition for reducing or removing ice formation from surfaces. This does not relate to the fluid of the present invention because the present invention is also useful in ice slurry application where all the ice generators today use the fact of ice formations on surfaces.

12 Kardos et al., U.S. Patent No. 4,689,165 discloses a heat transfer liquid which is non-toxic. This does not relate to the fluid of the present invention because the present invention is not only non toxic but also sound to the environment due to very high degree of biodegradability.

13. One skilled in the art of frost resistant, non-toxic heating/cooling fluids would not find it obvious to use any of the disclosures of the references applied against the above-identified application to obtain a non-toxic fluid which is also corrosion resistant, because the use of salt based heating/cooling fluids is normally involving big corrosion problems and therefore it is very likely to use extreme inhibitors with very bad influence on the environment but also to man. The inhibitors and the fluids in the US patents are developed for the automotive industry where worldwide only water or water/glycol solutions are used.

16. The present invention is particularly surprising because it was very difficult to find an effective corrosion inhibitor suited for the strong ionic solution, constituted by the salt solution according to the invention. Many corrosion inhibitors are film forming, which for a heating/cooling fluid is undesired since this causes a reduced heat transfer between the heating/cooling fluid and a metal surface.

In heating/cooling applications and especially in refrigeration systems the main focus have been on the cooling unit and the refrigerants instead of the heating/cooling fluid in the secondary refrigeration circuit.

The invention has also given proof to be very effective in a wide area of applications using the benefits of the combinations of the frost resistant components and the corrosion inhibitors of the fluid.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so make are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 03 06 10

N. Baffa  
(Signature)